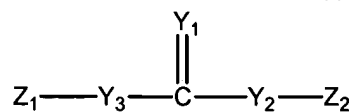


What is claimed is:

1. A compound having the formula:

(I)



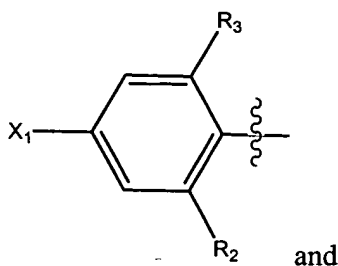
5 wherein:

$\text{Y}_{1-3}$  are independently O, S or  $\text{NR}_1$ ;

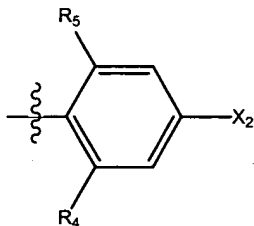
$\text{Z}_1$  and  $\text{Z}_2$  are independently selected substituted or unsubstituted aromatic hydrocarbons or substituted or unsubstituted heterocyclic aromatic groups containing an aldehyde or protecting group, and

- 10  $\text{R}_1$  is selected from the group consisting of hydrogen,  $\text{C}_{1-6}$  alkyls,  $\text{C}_{3-12}$  branched alkyls,  $\text{C}_{3-8}$  cycloalkyls,  $\text{C}_{1-6}$  substituted alkyls,  $\text{C}_{3-8}$  substituted cycloalkyls, aryls, substituted aryls, aralkyls,  $\text{C}_{1-6}$  heteroalkyls, substituted  $\text{C}_{1-6}$  heteroalkyls,  $\text{C}_{1-6}$  alkoxys, phenoxys and  $\text{C}_{1-6}$  heteroalkoxys.

- 15 2. The compound of claim 1, wherein  
 $\text{Z}_1$  is



$\text{Z}_2$  is



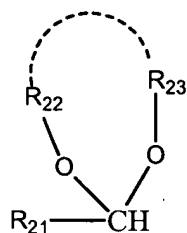
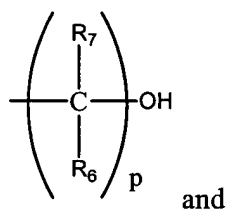
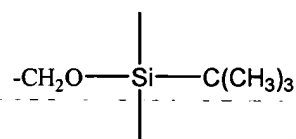
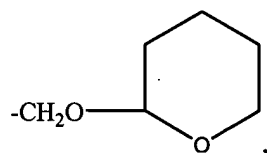
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wherein:

X<sub>1</sub> and X<sub>2</sub> are independently selected from the group consisting of

-CHO,

-NO<sub>2</sub>,



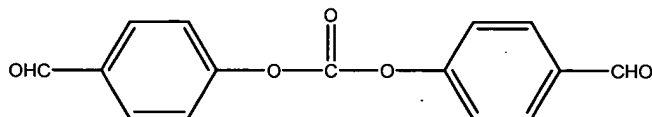
wherein

10 R<sub>2-7</sub> and R<sub>21</sub> are independently selected from the group consisting of hydrogen, C<sub>1-6</sub> alkyls, C<sub>3-12</sub> branched alkyls, C<sub>3-8</sub> cycloalkyls, C<sub>1-6</sub> substituted alkyls, C<sub>3-8</sub> substituted cycloalkyls, aryls, substituted aryls, aralkyls, C<sub>1-6</sub> heteroalkyls, substituted C<sub>1-6</sub> heteroalkyls, C<sub>1-6</sub> alkoxys, phenoxys and C<sub>1-6</sub> heteroalkoxys;

15 R<sub>22</sub> and R<sub>23</sub> are selected from the same group which defines R<sub>2</sub> and optionally together form a heterocyclic group; and  
p is a positive integer.

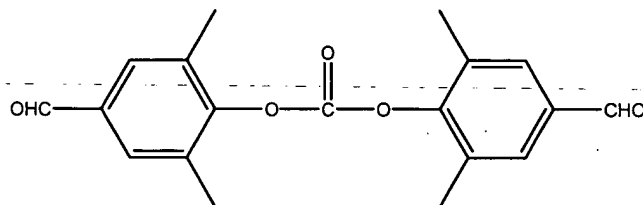
3. The compound of claim 2 wherein,  $Y_{1-3}$  are each O,  $R_{3-6}$  are independently one of hydrogen or a  $C_{1-6}$  alkyl, and  $Z_2$  is the same as  $Z_1$ .

4. The compound of claim 1 having the formula:

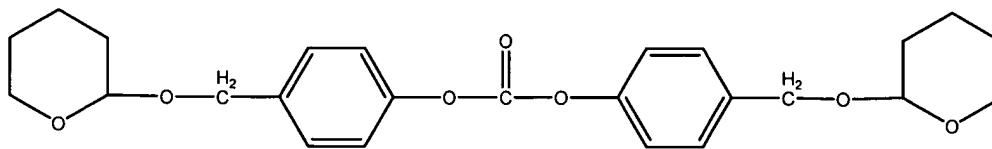


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5. The compound of claim 1 having the formula:

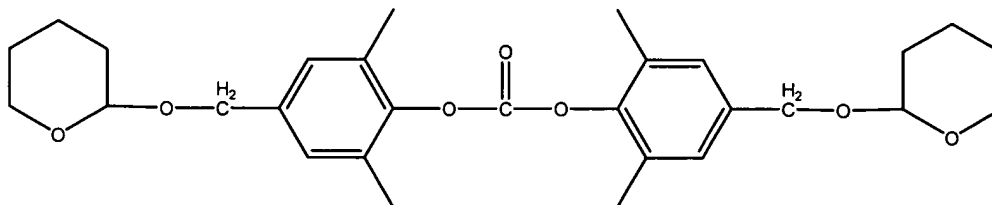


6. The compound of claim 1 having the formula:

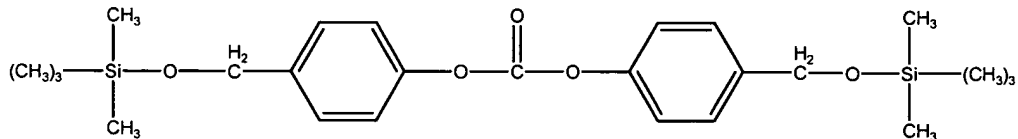


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7. The compound of claim 1 having the formula:

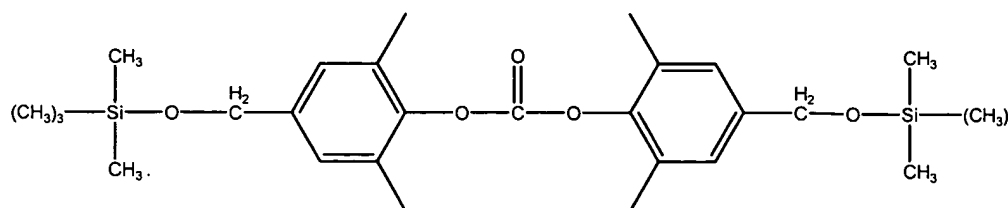


8. The compound of claim 1 having the formula:

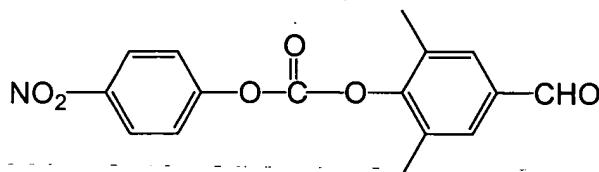


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9. The compound of claim 1 having the formula:

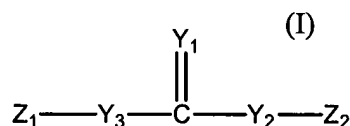


or



5 10. A method of preparing an activated nucleophile, comprising:

a) reacting a compound having the formula:



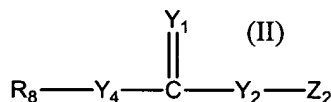
wherein:

$\text{Y}_{1-3}$  are independently O, S or  $\text{NR}_1$ ;

10  $\text{Z}_1$  and  $\text{Z}_2$  are independently selected substituted or unsubstituted aromatic hydrocarbons or substituted or unsubstituted heterocyclic aromatic groups containing an aldehyde or protecting group; and

$\text{R}_1$  is selected from the group consisting of hydrogen,  $\text{C}_{1-6}$  alkyls,  $\text{C}_{3-12}$  branched alkyls,  $\text{C}_{3-8}$  cycloalkyls,  $\text{C}_{1-6}$  substituted alkyls,  $\text{C}_{3-8}$  substituted cycloalkyls, aryls, substituted aryls, aralkyls,  $\text{C}_{1-6}$  heteroalkyls, substituted  
15  $\text{C}_{1-6}$  heteroalkyls,  $\text{C}_{1-6}$  alkoxys, phenoxys and  $\text{C}_{1-6}$  heteroalkoxys;

with a strong nucleophile under conditions sufficient to form a compound of formula (II):



20 wherein:

$\text{R}_8$  is a residue of a strong nucleophile;

$\text{Y}_4$  is  $\text{NR}_{20}$ , O or S;

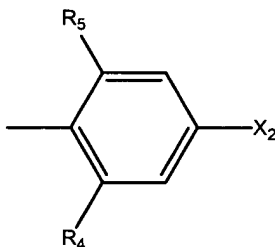
$Y_{1-2}$  are independently O, S or  $NR_1$ ;

$Z_2$  is a substituted or unsubstituted aromatic hydrocarbon or substituted or unsubstituted heterocyclic aromatic group containing an aldehyde or protecting group; and

- 5  $R_1$  and  $R_{20}$  are independently selected from the group consisting of hydrogen,  $C_{1-6}$  alkyls,  $C_{3-12}$  branched alkyls,  $C_{3-8}$  cycloalkyls,  $C_{1-6}$  substituted alkyls,  $C_{3-8}$  substituted cycloalkyls, aryls, substituted aryls, aralkyls,  $C_{1-6}$  heteroalkyls, substituted  $C_{1-6}$  heteroalkyls,  $C_{1-6}$  alkoxys, phenoxys and  $C_{1-6}$  heteroalkoxys.

10

11. The method of claim 10, wherein  $Z_2$  is:

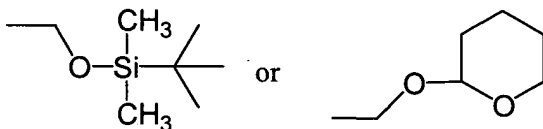


wherein:

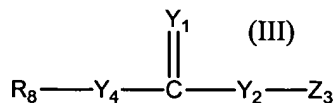
- $R_{4,5}$  are independently selected from the group consisting of hydrogen,  $C_{1-6}$  alkyls,  $C_{3-12}$  branched alkyls,  $C_{3-8}$  cycloalkyls,  $C_{1-6}$  substituted alkyls,  $C_{3-8}$  substituted cycloalkyls, aryls, substituted aryls, aralkyls,  $C_{1-6}$  heteroalkyls, substituted  $C_{1-6}$  heteroalkyls,  $C_{1-6}$  alkoxys, phenoxys and  $C_{1-6}$  heteroalkoxys; and  $X_2$  is an aldehyde or protecting group.

- 20 12. The method of claim 11, wherein  $X_2$  is CHO.

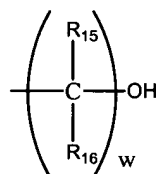
13. The method of claim 11, wherein  $X_2$  is



14. The method of claim 10, further comprising converting  $X_2$  to an alcohol and thereby forming a compound of the formula:
- 25



wherein  $\text{Z}_3$  is substituted or unsubstituted aromatic hydrocarbon or substituted or unsubstituted heterocyclic aromatic group substituted with



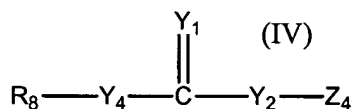
5 wherein

$\text{R}_{15-16}$  are independently selected from the group consisting of hydrogen,  $\text{C}_{1-6}$  alkyls,  $\text{C}_{3-12}$  branched alkyls,  $\text{C}_{3-8}$  cycloalkyls,  $\text{C}_{1-6}$  substituted alkyls,  $\text{C}_{3-8}$  substituted cycloalkyls, aryls, substituted aryls, aralkyls,  $\text{C}_{1-6}$  heteroalkyls, substituted  $\text{C}_{1-6}$  heteroalkyls,  $\text{C}_{1-6}$  alkoxys, phenoxys and  $\text{C}_{1-6}$  heteroalkoxys; and

10 w is a positive integer.

15. The method of claim 14, wherein p is 1.

16. The method of claim 14, further comprising reacting said compound  
15 of formula (III) with a moiety containing a leaving group under conditions sufficient to form an activated polymer of the formula:



wherein

$\text{R}_8$  is a residue of a strong nucleophile;

20  $\text{Y}_4$  is  $\text{NR}_{20}$ , O or S;

$\text{Y}_{1-2}$  are independently O, S or  $\text{NR}_1$ ;

$\text{R}_1$  and  $\text{R}_{20}$  are independently selected from the group consisting of hydrogen,  $\text{C}_{1-6}$  alkyls,  $\text{C}_{3-12}$  branched alkyls,  $\text{C}_{3-8}$  cycloalkyls,  $\text{C}_{1-6}$  substituted alkyls,  $\text{C}_{3-8}$  substituted cycloalkyls, aryls, substituted aryls, aralkyls,  $\text{C}_{1-6}$  hetero-

alkyls, substituted C<sub>1-6</sub> heteroalkyls, C<sub>1-6</sub> alkoxys, phenoxys and C<sub>1-6</sub> hetero-alkoxys; and

Z<sub>4</sub> is a leaving group.

5            17.    The method of claim 16, wherein said moiety containing a leaving group is selected from the group consisting of disuccinimidyl carbonate and *N*-hydroxyphthalamide.

10            18.    The method of claim 10, wherein R<sub>8</sub> comprises a polyalkylene oxide residue.

19.    The method of claim 18, wherein R<sub>8</sub> is a polyethylene glycol residue.

15            20.    The method of claim 18, wherein R<sub>8</sub> comprises -O-(CH<sub>2</sub>CH<sub>2</sub>O)<sub>x</sub> and x is the degree of polymerization.

21.    The method of claim 18, wherein R<sub>8</sub> has a weight average molecular weight of from about 20,000 to about 100,000.

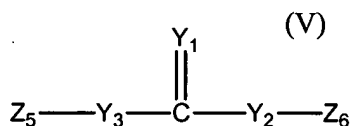
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22.    The method of claim 10, wherein R<sub>8</sub> has a weight average molecular weight of from about 25,000 to about 60,000.

25            23.    The method of claim 16, further comprising reacting the activated polymer of formula IV with a biologically active compound to form a polymer conjugate.

24.    A method of preparing an activated nucleophile, comprising:

a)    reacting a compound having the formula:

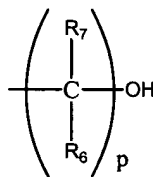


30

wherein:

Y<sub>1-3</sub> are independently O, S or NR<sub>1</sub>;

Z<sub>5</sub> and Z<sub>6</sub> are independently selected substituted or unsubstituted aromatic hydrocarbons or substituted or unsubstituted heterocyclic aromatic groups, substituted with



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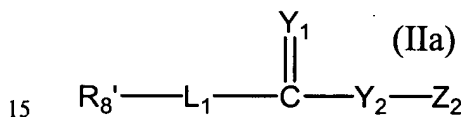
wherein

R<sub>1</sub> and R<sub>6-7</sub> are independently selected from the group consisting of hydrogen, C<sub>1-6</sub> alkyls, C<sub>3-12</sub> branched alkyls, C<sub>3-8</sub> cycloalkyls, C<sub>1-6</sub> substituted alkyls, C<sub>3-8</sub> substituted cycloalkyls, aryls, substituted aryls, aralkyls,

10 C<sub>1-6</sub> heteroalkyls, substituted C<sub>1-6</sub> heteroalkyls, C<sub>1-6</sub> alkoxys, phenoxys and C<sub>1-6</sub> heteroalkoxys;

p is a positive integer; and

with a nucleophile under conditions sufficient to form a compound of Formula (IIa):



15

wherein:

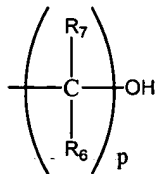
R<sub>8</sub>' is a nucleophile residue;

L<sub>1</sub> is a bifunctional linker

Y<sub>1-2</sub> are independently O, S or NR<sub>1</sub>;

20

Z<sub>6</sub> is a substituted or unsubstituted aromatic hydrocarbon or substituted or unsubstituted heterocyclic aromatic group, substituted with



; and

R<sub>1</sub>, R<sub>6-7</sub> and R<sub>20</sub> are independently selected from the group consisting of hydrogen, C<sub>1-6</sub> alkyls, C<sub>3-12</sub> branched alkyls, C<sub>3-8</sub> cycloalkyls, C<sub>1-6</sub> substituted



alkyls, C<sub>3-8</sub> substituted cycloalkyls, aryls, substituted aryls, aralkyls, C<sub>1-6</sub> heteroalkyls, substituted C<sub>1-6</sub> heteroalkyls, C<sub>1-6</sub> alkoxy, phenoxy and C<sub>1-6</sub> heteroalkoxy.